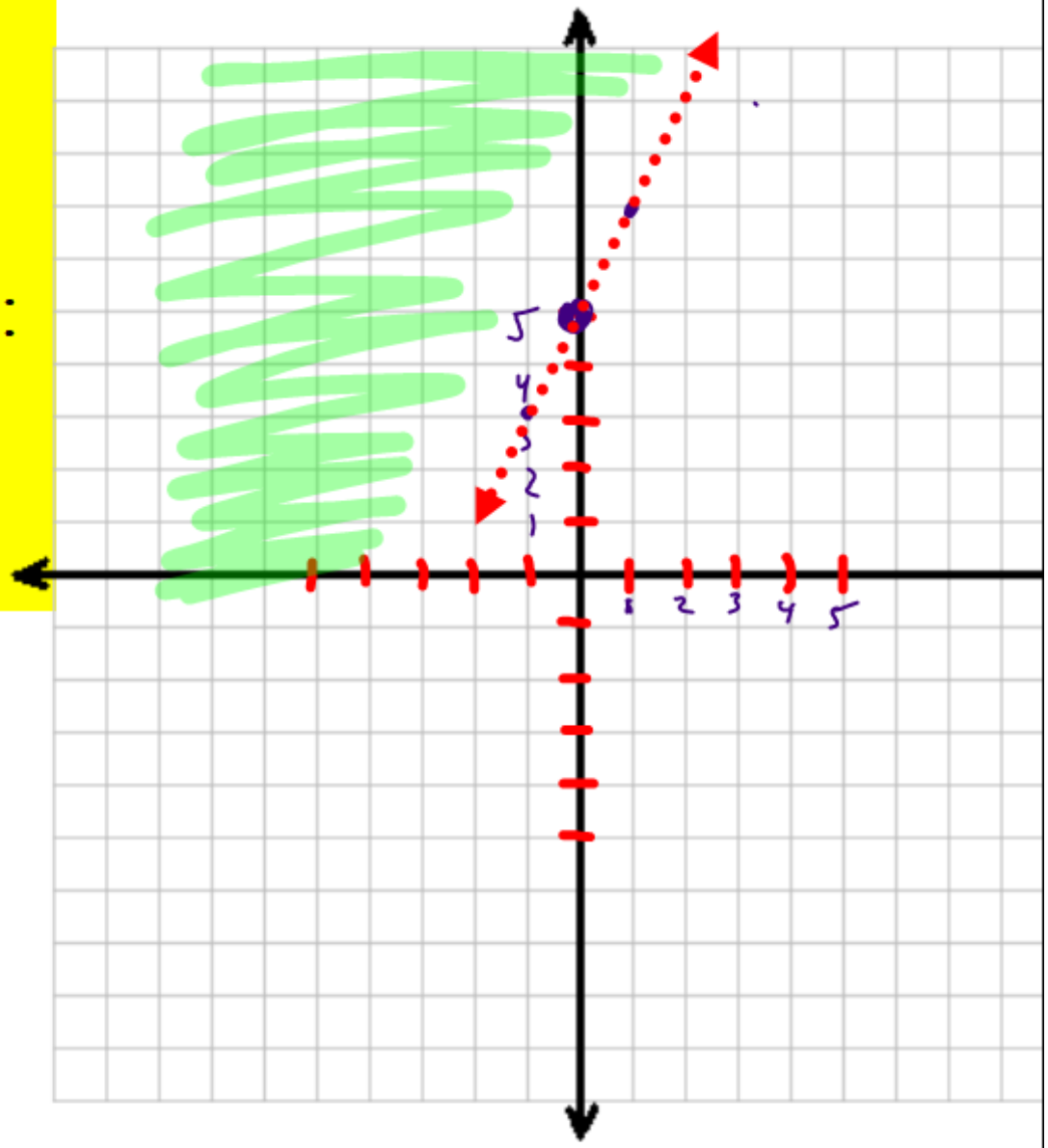
Warmup:

Graph the inequality below:

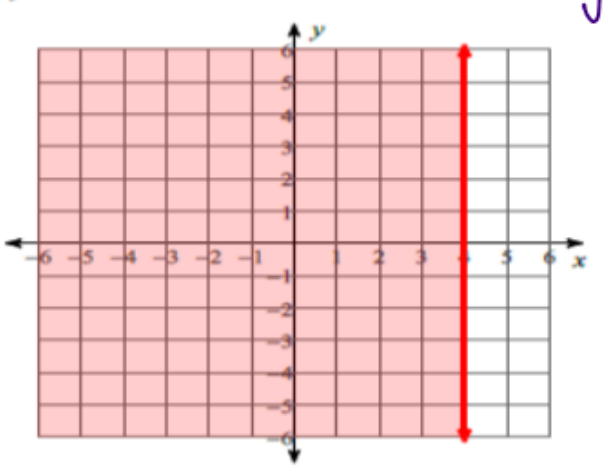
$y > 2x + 5$

positive

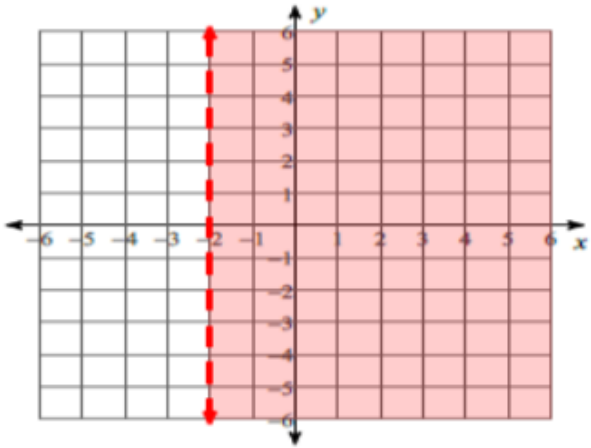


1) $x \leq 4$

vertical

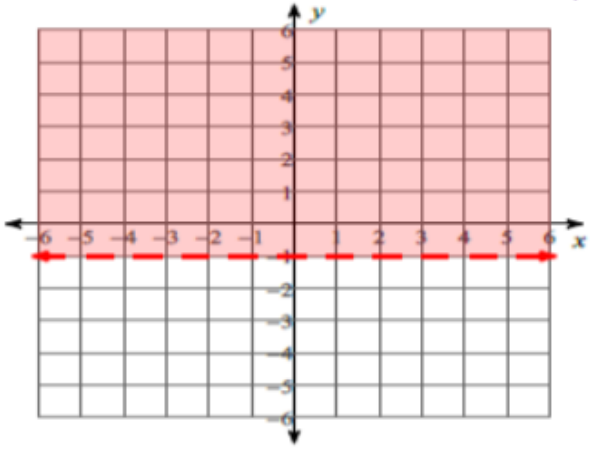


2) $x > -2$

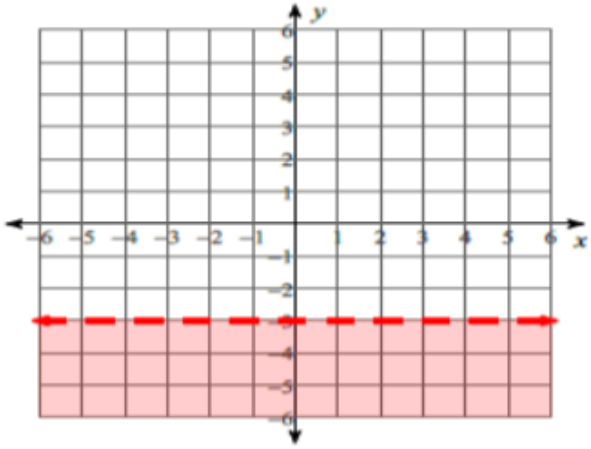


3) $y > -1$

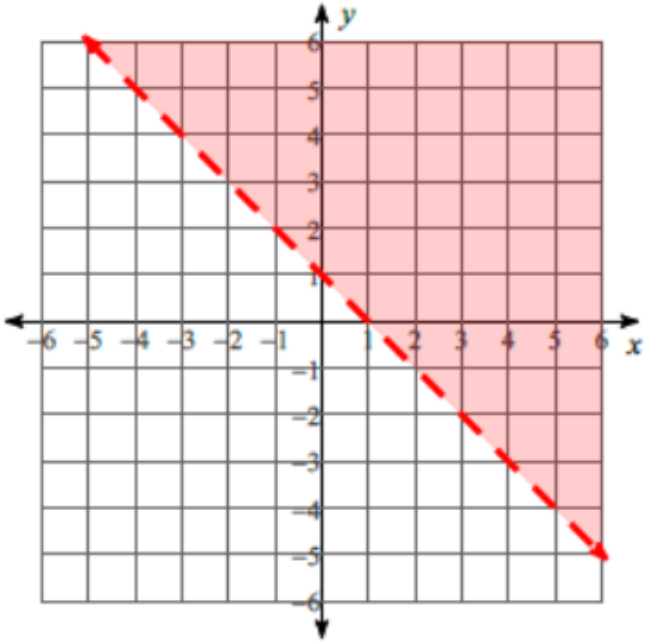
horizontal



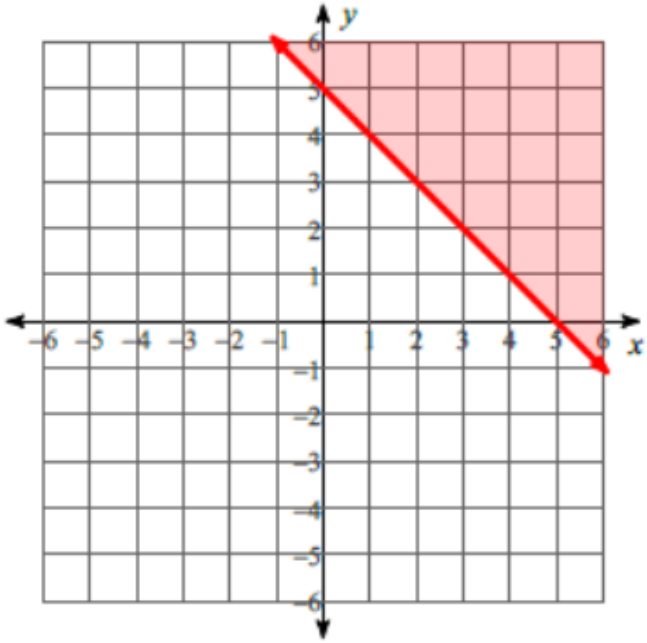
4) $y < -3$



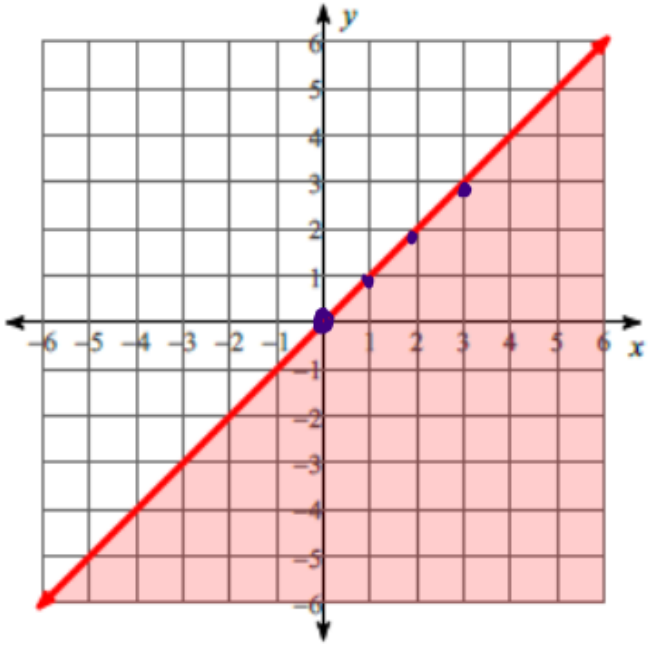
5) $y > -x + 1$



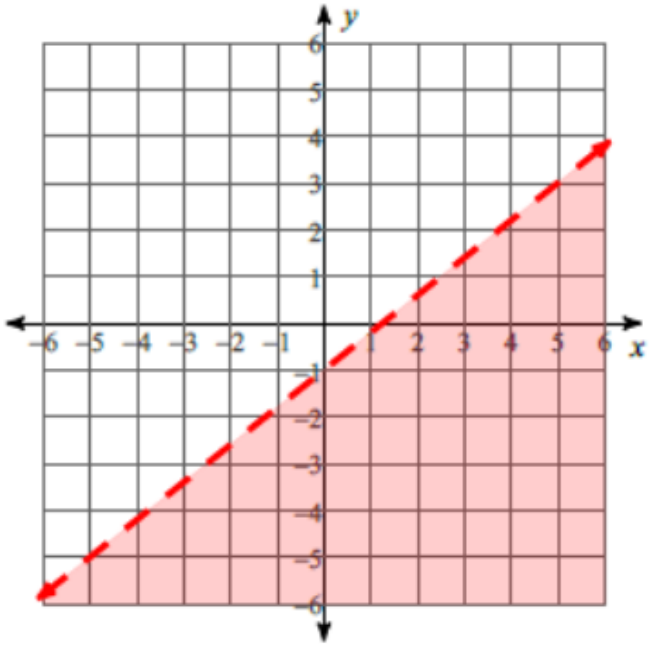
6) $y \geq -x + 5$



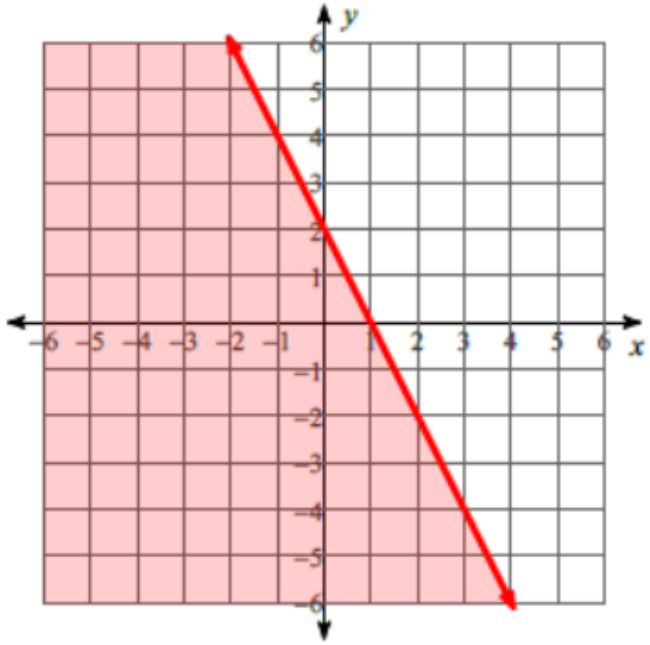
7) $y \leq x$



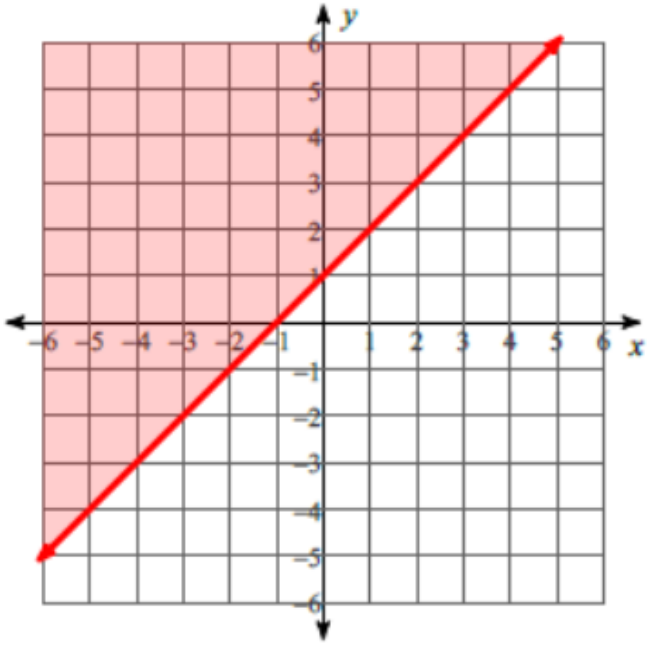
8) $y < \frac{4}{5}x - 1$



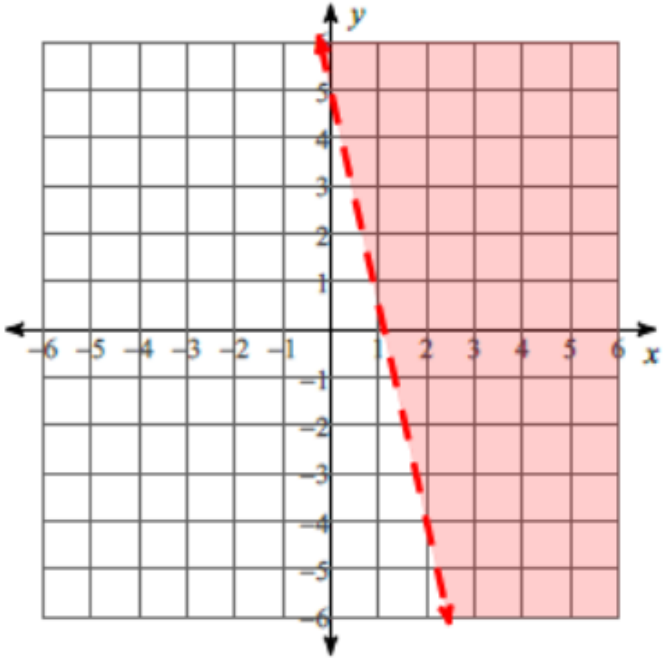
9) $2x + y \leq 2$



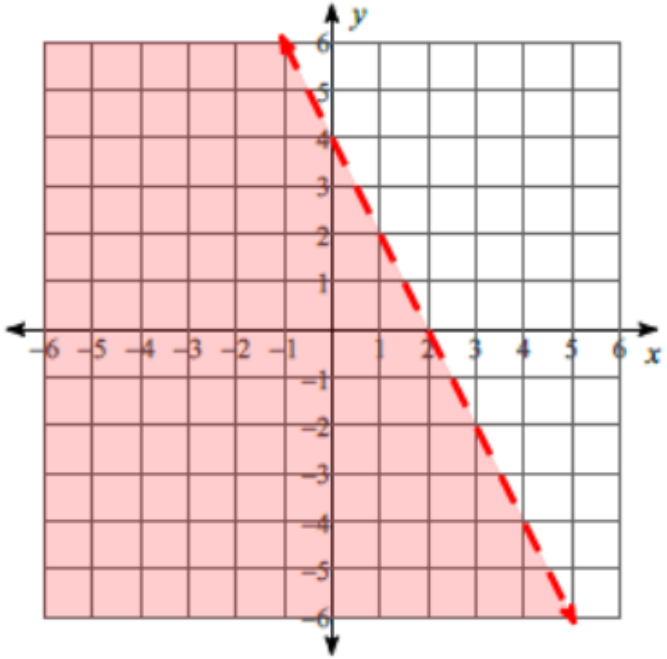
10) $x - y \leq -1$



11) $9x + 2y > 10$



12) $2x + y < 4$



Quiz #5

Graphing Equations and Inequalities

E.Q.:
How do I solve a system of linear equations graphically?

MGSE9-12.A.REI.5 Show and explain why the elimination method works to solve a system of two-variable equations.

MGSE9-12.A.REI.6 Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.

Best Buy Tickets

Susie is organizing the printing of tickets for a show her friends are producing.
She has collected prices from several printers and these two seem to be the best.

SURE PRINT
Ticket printing
25 tickets for $2

BEST PRINT
Tickets printed
$10 setting up
plus
$1 for 25 tickets

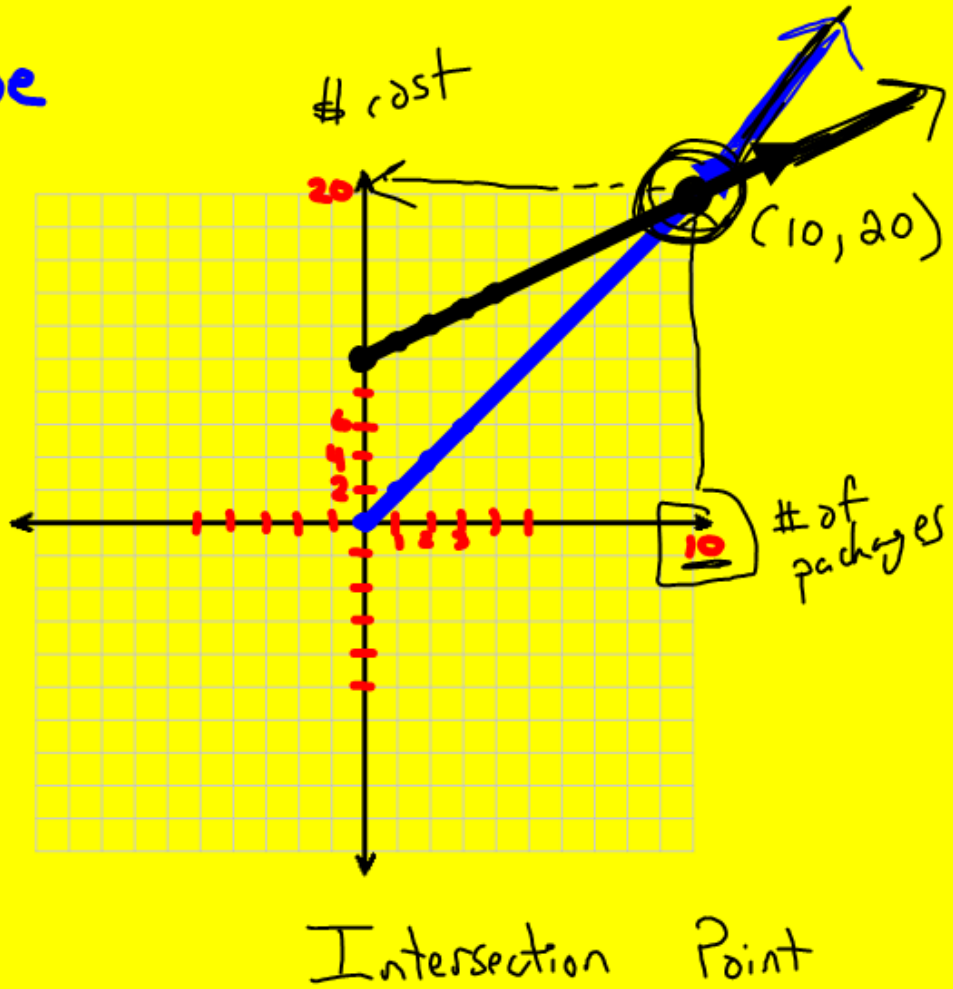
let x = number of 25 ticket packages
let y = cost in $

Sure Print: $y = 2x$
Best Print: $y = x + 10$

Sure Print: $y = 2x$ blue

Best Print: $y = x + 10$ black

What can Susie tell from these graphs about the ticket packages she can purchase?

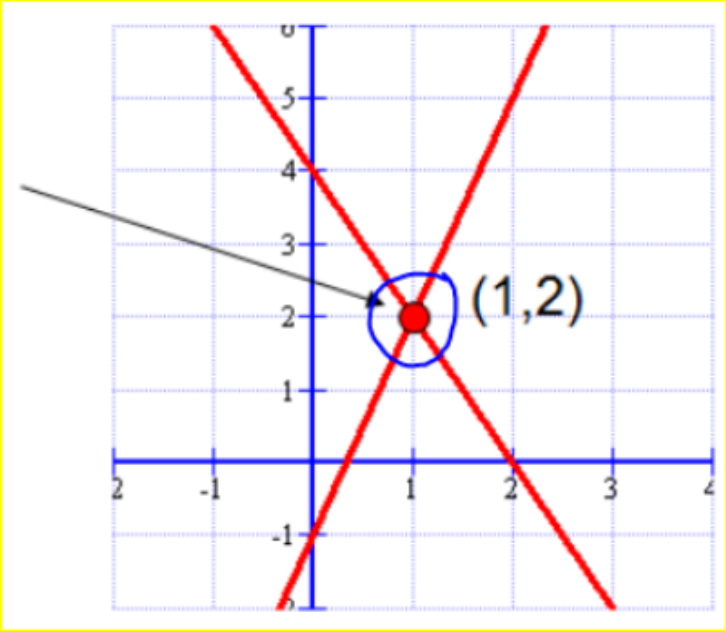


❖What is a system of equations?

- A system of equations is when you have two or more equations using the same variables.
- The solution to the system is the point that satisfies ALL of the equations. This point will be an ordered pair.
- When graphing, you will encounter three possibilities.

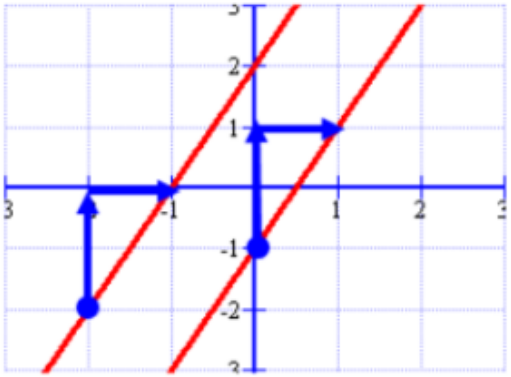
1. Intersecting Lines

- The point where the lines intersect is your solution.
- The solution of this graph is (1, 2)



2. Parallel Lines

- These lines never intersect!
- Since the lines never cross, there is **NO SOLUTION**!
- Parallel lines have the same slope with different y-intercepts.



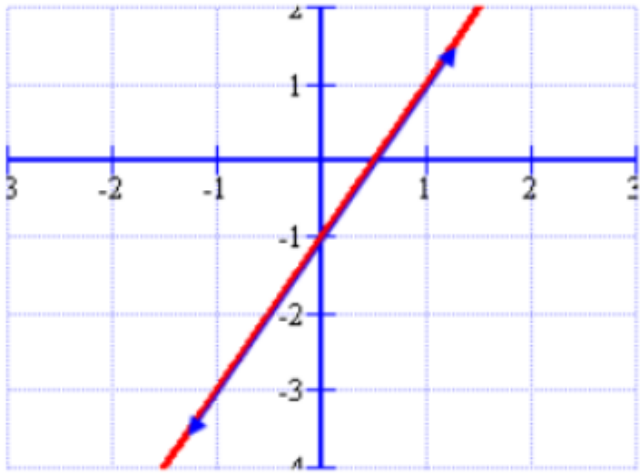
$$\text{Slope} = \frac{2}{1} = 2$$

y-intercept = 2

y-intercept = -1

3. Coinciding Lines

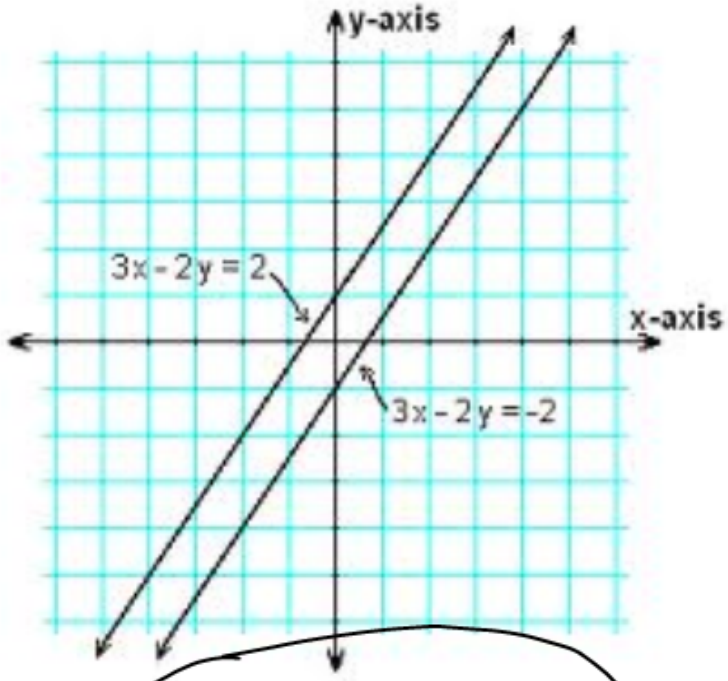
- These lines are the same!
- Since the lines are on top of each other, there are **INFINITELY MANY SOLUTIONS!**
- Coinciding lines have the same slope and the same y-intercepts.



$$\text{Slope} = \frac{2}{1} = 2$$

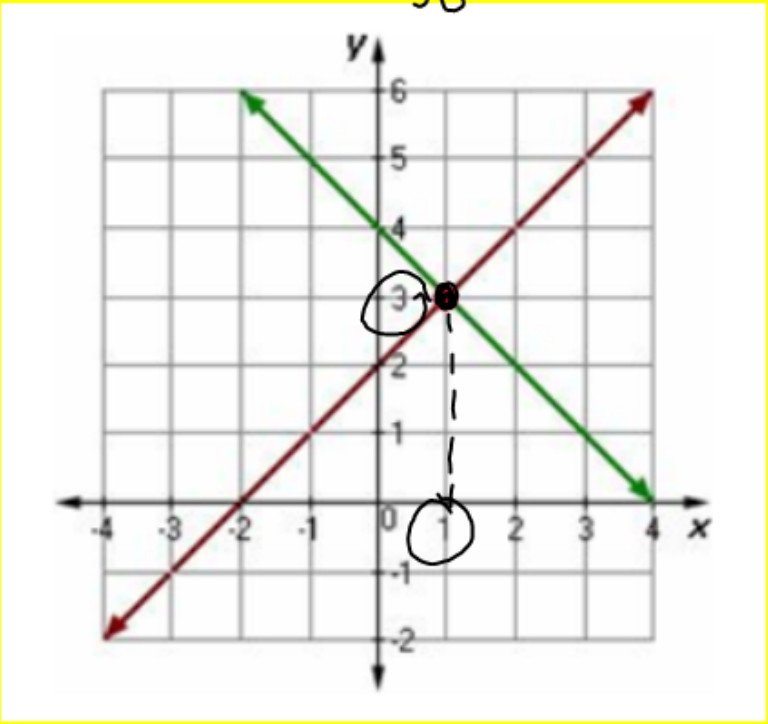
$$\text{y-intercept} = -1$$

State the solution for each system.



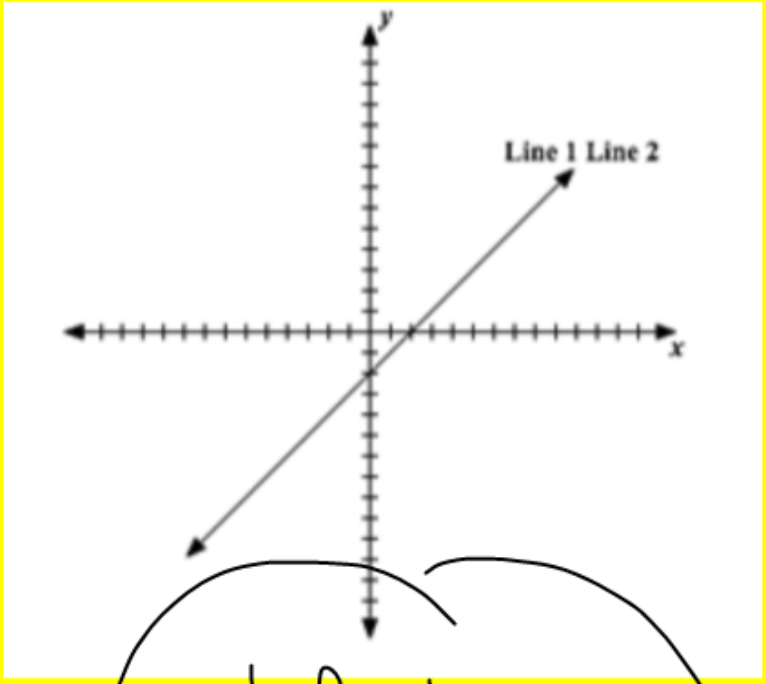
No Solutions

(x, y)

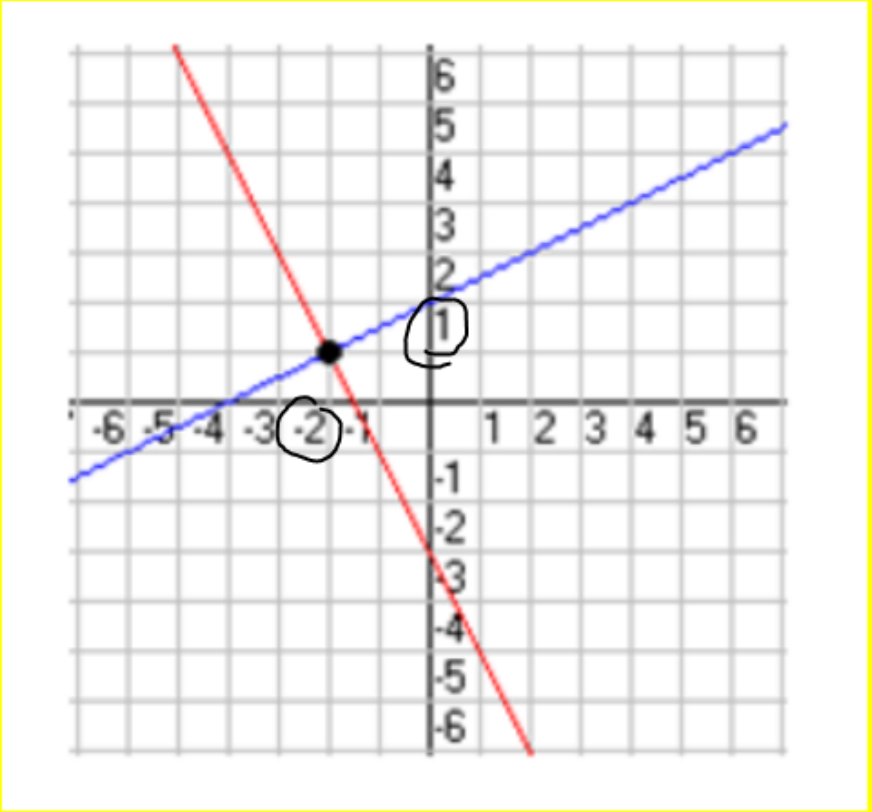


(1, 3)

State the solution for each system.



Infinite Solutions



(-2, 1)

❖ Graphing Linear Systems to Find Solutions:

Ex 1. $y = -2x + 4$

$y = x - 2$

$0 = -2(2) + 4$
$= -4 + 4$
$= 0$ ✓

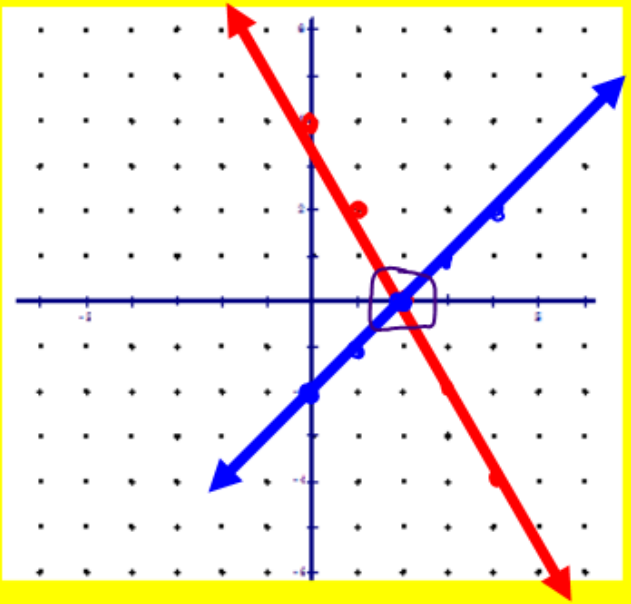
$0 = 2 - 2$
$0 = 0$ ✓

Step 1: Graph $y = -2x + 4$ m = -2 b = 4

Step 2: Graph $y = x - 2$ m = 1 b = -2

Step 3: Find intersection point. (2, 0)

Step 4: Check your solution.



Example 2: $y = 2x - 3$
$-2x + y = 1$

No Solutions

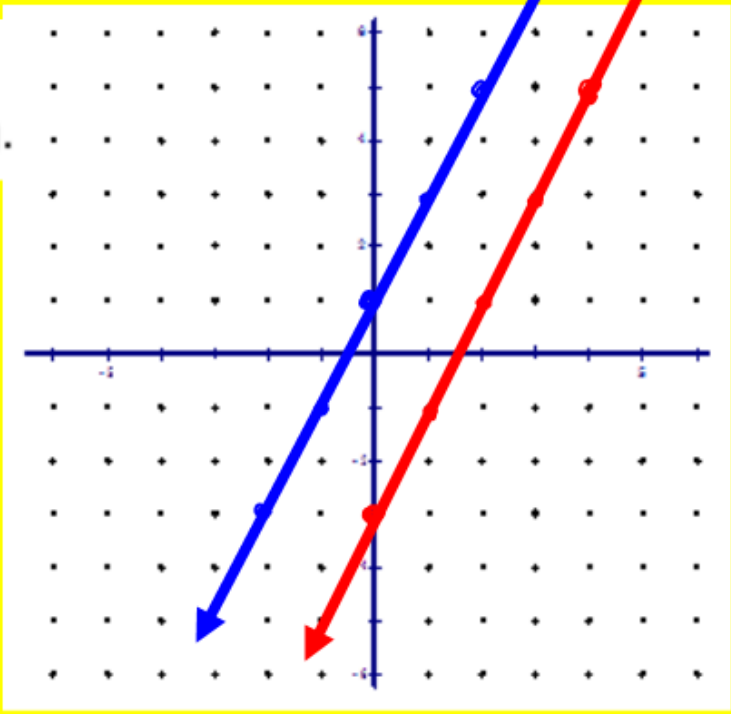
Step 1: Graph $y = 2x - 3$ m = 2 b = -3

Step 2: Graph $-2x + y = 1$

Put this equation in slope-intercept form.

$-2x + y = 1$

$+2x \quad +2x$



y = $2x + 1$ m = 2 b = 1

Example 3: $3x - y = 8$

$-3x \quad -3x$

$\frac{-y}{-1} = \frac{-3x}{-1} + \frac{8}{-1}$

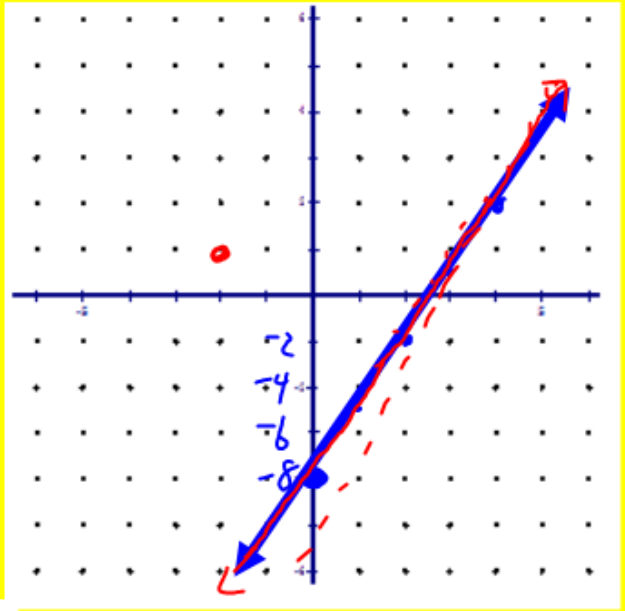
$$2y = 6x - 16$$

$\frac{}{2} \quad \frac{}{2} \quad \frac{}{2}$

Step 1: Put BOTH equations into slope-intercept form

y = 3x - 8 m = 3 b = -8

y = 3x - 8 m = 3 b = -8



Step 2: Graph both equations.

Infinite Solutions

Let's summarize! There are **3 steps** to solving a system using a graph.

Step 1: Graph both equations.

Graph using slope and y – intercept.

Step 2: Do the graphs intersect?

This is the solution! LABEL the solution!

Step 3: Check your solution.

Substitute the x and y values into both equations to verify the point is a solution to both equations.

Homework #7:

Solving Systems of Equations by Graphing